

# NASA Facts

National Aeronautics and  
Space Administration

## NASA Headquarters

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## Education

### *Excellence and Involvement*

NASA's direction for education is set forth in the NASA Strategic Plan as one of the Agency's five contributions to the Nation's science and technology goals and priorities:

**Educational Excellence.** *We involve the educational community in our endeavors to inspire America's students, create learning opportunities, and enlighten inquisitive minds.*

This contribution is accomplished through implementation of a full range of NASA education programs and activities that contribute to the various efforts and activities of those involved with and in the education community, and benefit the participants as well as advance the mission of the Agency.

### Major Programs

- **Student Support**—use the NASA mission, facilities, human resources, and programs to provide information, experiences, and research opportunities for students at all levels to support the enhancement of knowledge and skills in the areas of science, mathematics, technology, and geography.
- **Teacher/Faculty Preparation and Enhancement**—use the NASA mission, facilities, human resources, and programs to provide exposure and experiences to educators and faculty to support the enhancement of knowledge and skills, and to provide access to NASA information in science, mathematics, technology, and geography.
- **Support for Systemic Improvement of Education**—use NASA's unique assets to support local, state, regional, and national science, mathematics, technology, engineering, and geography education change efforts through collaboration with internal and external stakeholders.
- **Curriculum Support and Dissemination**—develop, utilize, and disseminate science, mathematics, technology, and geography instructional materials based on NASA's

unique mission and results, and to support the development of higher education curricula.

- **Educational Technology**—research and develop products and services that facilitate the application of technology to enhance the educational process for formal and informal education and lifelong learning.
- **Research and Development**—involve the education community, particularly higher education, in NASA programs that contribute to the development of new knowledge in support of the NASA mission, and to utilize the talent and resources of the higher education community.

### Program Achievements

Progress towards the Education Program goal of educational excellence is measured in two ways, excellence and involvement.

- **Excellence:** NASA seeks to be judged by its customer, the education community, as providing excellent and valuable educational programs and services. Therefore we will attempt to maintain an "Excellence" rating ranging between 4.3 and 5.0 (on a 5.0 scale) as rated by our customers.

Progress towards this metric is measured by a quality rating by the educational customer of NASA's performance. The following data was collected in FY 1999:

Participant ratings of excellence (score: 5=excellent to 1=very poor; total participants reporting: 30,071 participants responding; not all participants are asked all 4 questions; 62-82 programs reporting)

- 4.70 Recommend to others
- 4.69 Rate staff
- 4.58 Expect to apply what was learned

- 4.68 Valuable experience
- Overall average for excellence: 4.66
- **Involvement:** NASA strives to involve the educational community in our endeavors. Therefore, at the proposed funding level, we seek to maintain a level of participant involvement of approximately three million with the education community, including teachers, faculty, and students.

Progress towards this metric is measured in two ways: (1) total number of participants, including students, teachers, faculty administrators, etc., involved in NASA education programs; and (2) number of partnerships/collaborations. The following data was collected:

Total involvement in NASA Education activities, 37,360,885 (189 programs reporting):

- In-person: 3,702,645
- Electronic: 9,020,044
- General public: 24,638,196

Types of K-12 schools represented (5,294 participants reporting):

- 30% urban
- 37% suburban
- 33% rural

NASA programs and external alliances:

- 6,096 instances of alliances
- higher education institutions
- industry; contractors
- other NASA facilities
- Educator Resource Center Network
- non-profits
- local community
- school districts

## Current Activities

Examples of NASA's current education programs include:

- Summer High School Apprentice Research Program (SHARP/SHARP Plus), emphasizing underrepresented minority participation, involves approximately 500 high school students in intensive research apprenticeships with NASA, industry, and university scientists and engineers. SHARP students live within commuting distance of a NASA installation; SHARP PLUS students have residential research experiences at a participating Historically Black College or University or a predominately minority institution.

- The NASA Student Involvement Program continues to promote literacy in science, mathematics, and technology among students in grades 3-12. More than 3,211 students continued to participate in the program. The program insures linkages with the NASA Enterprises and provides standards-based, hands-on, inquiry-oriented learning experiences, including an opportunity for high school students to fly experiments on the Space Shuttle or a sounding rocket.
- Teacher preparation programs such as Project NOVA disseminate nationally an undergraduate pre-service model based on standards and benchmarks for science, mathematics, and technology. NOVA links higher education faculty across several disciplines to create these models. To date, more than 81 colleges and universities have participated.
- The Aerospace Education Services Program (AESP) delivers educational services on a State-by-State basis. AESP specialists are directly involved in supporting state systemic improvement by providing technical linkages to NASA research and development and education programs and services. Each education specialist is assigned one or two States so they might become familiar with their States' science, mathematics, and technology education agenda and the education leaders within these States. This enables them to customize or tailor their teacher workshops to fit that particular State's framework.
- The National Space Grant College and Fellowship Program continues to evolve as a national network of institutions with interests in aeronautics, Earth/space sciences and technology. Space Grant Consortia are present in every State, plus the District of Columbia and Puerto Rico, involving more than 700 institutions.
- FY 1999 marked the sixth year of the NASA EPSCoR program with reduced funding for the original six awardees. These six states have been very successful in a short period of time, as evidenced by the metrics previously cited. In addition, four new states were chosen in the second round of awards in late FY 1996 (Kansas, Nebraska, Oklahoma, and South Carolina). They are completing their third year of work, and are expected to be as successful as the first group. Congressional direction in FY 1999 increased the funding for this program to 10.0M. This enabled all eligible NASA EPSCoR states to receive planning grant funding for all twenty states. These awards will help these programs prepare for the next round of awards, scheduled for FY 2001.
- The NASA Classroom of the Future (COTF) continues to be a major component of the educational technology program. The role of the COTF is to translate NASA technologies and research results into learning tools, demonstrations, and teacher enhancement programs that support standards-based education reform.

- The NASA CONNECT program, an instructional television and Web-based series, demonstrates workplace math, science, and technology as collaborative processes. The teaching protocol is through reflective discussion, video engagement, dialogue notes, journal writing, and online engagement. The program is designed to raise student awareness of careers requiring math, science, and technology. This awareness will allow the students to overcome stereotyped beliefs regarding females and minorities in math, science, and technology.
- The Learning Technologies Project provides demonstration projects and online systems dedicated to bringing NASA science to teachers and students in the classroom using examples from NASA's unique missions. The goal of this program is to accelerate the implementation of a national information infrastructure through NASA science, engineering, and technology contributions and to facilitate the use of technologies within the K-12 education systems.
- NASA Spacelink is an electronic resource specifically developed for the educational community. Spacelink is a "virtual library" in which electronic versions of NASA's educational products and hundreds of NASA World Wide Web links are arranged for educators. Educators can search this virtual library to find information regardless of its location within NASA.

## Partnerships

The presidents of the Astronaut Memorial Foundation, Challenger Center for Space Science Education, U.S. Space Camp, U.S. Space Foundation, Young Astronaut Council,

Kansas Cosmosphere, and Space Center Houston continue to work with NASA through the National Aerospace Education Alliance. This Alliance seeks to leverage individual efforts in supporting NASA's contribution to education excellence.

NASA's Innovative Reform Initiatives program supports standards-based systemic improvement efforts and priorities, and focuses on science, mathematics, technology, and geography education. To prevent duplication and to strengthen the impact of systemic reform initiatives, NASA confers with other Federal agencies and national organizations that are also working with educational systemic reform, including the National Science Foundation, U.S. Department of Education, National Research Council, Council of Chief State School Officers, and professional education organizations such as the National Science Teachers Association, National Council for the Teaching of Mathematics, and the International Technology Education Association. Systemic reform initiatives are accomplished through partnerships with local, State, and national stakeholders including professional education associations, national aerospace education associations, industries, education agencies, and other interest groups. When NASA becomes a partner with these groups, its role varies between providing supportive leadership, being a complementary participant, or acting as a facilitator to empower and enable wide reaching educational reform that is systemic in nature. Examples of these partnerships are the National Alliance of State Science and Math Coalitions (NASSMC), the Council of State Science Supervisors (CS3), the NASA Industry Education Initiative (NIEI). These partnerships are each mutually beneficial in creating systemic change by increasing the customer and support bases for both NASA and the partnering stakeholder.